

SCIENTISTS IN TIMES OF WAR

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COPENHAGEN

TUXEDO PARK

MY WWII EXPERIENCES

SCIENTISTS IN TIMES OF WAR

PROBLEMS IN 2003

CONCLUSIONS

COPENHAGEN

GREAT SCIENTISTS - BOHR + HEISENBERG
LONDON - DID NOT RESEMBLE ORIGINALS
IMAGINARY DISCUSSION: WHY VISIT SEPT 1941.
EXCELLENT PLAY - INTELLECTUAL AND
SCIENTIFIC DISCUSSIONS. FRAYN
INFLUENCED JUNGK'S "BRIGHTER..."
AND HEISENBERG LETTER 17 YEARS
LATER. BOHR IN UNSENT LETTER
DISAGREED. ALTHOUGH FRAYN
REACHED NO CONCLUSION PLAY
WEIGHTED TOWARD HEISENBERG
WHEREAS I FAVOR BOHR.
HEISENBERG VISIT TO THE
NETHERLANDS. TRAGEDY OF
LOYALTY TO ONE'S COUNTRY
WHEN IT IS BADLY MISLED.

TUXEDO PARK

A FASCINATING BOOK ABOUT ALFRED LOOMIS. MULTI-MILLIONE INVESTOR. 1929 STOCK MARKET CRASH. FRIEND STIMSON AND CONANT.

AMATEUR SCIENTIST TUXEDO PARK LAB. MICROWAVES. CHAIRMAN MICROWAVE SECTION NDRC.

BRITISH MISSION SUMMER 1940
BATTLE FOR BRITAIN. NEED MICROWAVE RADAR FOR NIGHT FIGHTERS.

RAPID RESPONSE OF U.S. DUE IN PART TO LOOMIS GOOD JUDGEMENT AND ORGANIZING ABILITY. AS ONE OF FIRST SCIENTISTS WORKING IN MIT RADIATION LAB, WELL AWARE OF HIS CONTRIBUTIONS TO POLICY AND ORGANIZATION BUT NOT TO SCIENCE

MY WWII EXPERIENCES

1940: PERSONALLY GREAT YEAR: MARRIED,
FIRST PH.D. USING MAGNETIC RESONANCE
WITH I.I. RABI, DISCOVER D ELECT.
QUAD. MOMENT, UNIV. OF ILLINOIS
INTERNATIONALLY DISASTROUS. NAZIS
IN CONTROL GERMANY WITH INHUMAN
POLICIES, EXPANSION TO SARRLAND
AUSTRIA AND CZECHOSLOVAKIA.
WWII STARTED. NETHERLANDS, BELGIUM,
DENMARK, FRANCE OCCUPIED AND
BRITISH EVACUATED AT DUNKIRK

MIT RADIATION LAB

MAGNETRON GROUP → LEADER ADVANCED
DEVELOPMENT GROUP → 3 cm (X-BAND)
X-BAND SYSTEMS (AI, ASV) → ENGLAND →
CRYSTALS + TR BDX → X-BAND SYSTEMS →
SECTY WAR → 5 YR PROGRAM FOR RADAR.

LOS ALAMOS (1943-45)

LEADER DELIVERY GROUP, DEPUTY TO
HEAD OF ORDNANCE DIVISION.

TINIAN -

CHIEF SCIENTIST PROJECT A → END
OF WAR → COLUMBIA

SCIENTISTS IN TIMES OF WAR

BENEFITS:

1. INTERACTIONS WITH OTHER SCIENTISTS.
2. INTERESTING ENVIRONMENTS - CAMBRIDGE,
LOS ALAMOS, TINIAN.
3. HIGHER PAY
4. RAPID PROMOTIONS
5. SATISFACTION OF HELPING TO
WIN AND TERMINATE A
TERRIBLE WAR THAT KILLED
~30 MILLION
6. DEVELOPMENT OF SCIENTIFIC
TECHNOLOGIES VALUABLE IN
PEACE TIME RESEARCH.

EVILS:

1. LOSS TO WAR RESEARCH OF WHAT SHOULD HAVE BEEN MOST PRODUCTIVE RESEARCH YEARS.
2. CLOSING OR DESTRUCTION OF
3. SECRECY, CLASSIFICATION & SECURITY CLEARANCE.
4. INTERFERENCE WITH TEACHING AND GRADUATE TRAINING.
5. WAR IS A TERRIBLE THING. FORCE WILL ON OTHERS BY DESTROYING PROPERTY AND KILLING PEOPLE.
6. SCIENCE AND TECHNOLOGY EFFECTIVE IN WAR BUT THAT MEANS KILLING MORE PEOPLE UNLESS WAR STOPPED EARLIER. NOT JUST NUCLEAR WEAPONS: RADAR GUIDED MISSIONS PROBABLY KILLED MORE THAN ATOMIC BOMBS.

7. DIFFICULT TO STOP A WAR. KOSOVO.

8. MORAL DILEMMAS TO INDIVIDUALS.

SHOULD THEY CONTRIBUTE TO THE
KILLING AND UNDER WHICH CIRCUMSTANCES?
PRE-EMPTIVE STRIKES?

9. MORAL DILEMMAS TO NATIONS

BEFORE AND DURING A WAR. DECISION
TO USE NUCLEAR BOMBS IN WWII
PROBABLY SAVED LIVES BY ENDING
A TERRIBLE WAR EARLIER BUT
DOES THAT JUSTIFY THE DIRECT
KILLING?

CONCLUSIONS

- a. AVOID NUCLEAR WAR!!! DONT DILUTE BY COMBINING WITH OTHER ISSUES.
 - b. RECOGNIZE EXISTENCE OF GLOBAL NUCLEAR DETERENT.
 - c. AVOID PRE-ENPTIVE FIRST STRIKE.
 - d. AVOID STARTING WAR IN OPPOSITION TO U.N. EVEN IF WIN QUICKLY, BAD PRECIDENT AND JEOPARDIZES HOPES FOR A MORE PEACEFUL WORLD.
 - e. TRY TO AVOID WEAPONS OF MASS DESTRUCTION BEING USED EVEN ONCE. DOES NOT REQUIRE PRE-EMPTIVE STRIKE.
- NEW PROBLEM.

f. DEVELOP OTHER AND BETTER SOLUTIONS

1. CONTAINMENT

2. KEEP WEAPONS INSPECTORS ON DUTY

3. DEVELOP PROCEDURES TO MAKE IT CLEARER TO ALL THAT PUNISHMENT FOR FIRST USE OF WEAPONS OF MASS DESTRUCTION WILL EXCEED ANTICIPATED GAINS.

4. INSTITUTIONS SUCH AS UNIVERSITIES AND FERMILAB THAT THRIVE ON CREATIVE IDEAS SHOULD VOLUNTARILY DEVELOP AND SUGGEST SOLUTIONS.

5. TO ENCOURAGE SUCH DISCUSSIONS

I AM SUMITTING A PROPOSAL THAT I PLAN TO SUBMIT WITH THE HOPE THAT IT WILL INSPIRE YOU TO COME UP WITH MORE AND BETTER PROPOSAL.

PROPOSED TREATY TO REDUCE NUCLEAR PROLIFERATION AND THE RISKS OF ESCALATION

1. FOR SIMPLICITY LIMITED TO NUCLEAR PROLIFERATION BUT A TREATY BASED ON SIMILAR PRINCIPLES COULD BE DEVISED FOR CHEMICAL AND BIOLOGICAL WEAPONS AND FOR TERRORISM.
2. THE PURPOSE OF THE TREATY IS TO MAKE IT CLEAR THAT ANY NATION CONSIDERING THE LAUNCH OF A FIRST NUCLEAR STRIKE WILL LOSE MUCH MORE THAN CAN BE GAINED.
3. IF A NATION MAKES A FIRST NUCLEAR ATTACK ON ANOTHER AND IF A NATION SIGNING THIS

THIS TREATY PUNISHES THE ORIGINAL
ATTACKING NATION WITH THE
SPECIFIED LIMITED RESPONSE, THE
OTHER SIGNATORIES TO THE TREATY
AGREE NOT TO USE THIS RESPONSE
AS A REASON TO ATTACK THE
NATION WHICH INFLICTED THE
PUNISHMENT.

OMITTED ANECDOTES

1. FIRST MIT RADIATION LAB MICROWAVE DEVICE. RABI, PURCELL, RAMSEY
2. FIRST FLIGHT OF X-BAND ASV.
3. CRYSTALS AND TR BOX-ENGLAND → US
4. FIRST 5 YEAR PROCUREMENT PROGRAM FOR AIR FORCE RADAR.
5. AIR CONDITIONERS FOR PROJECT A.
6. KIT, BOMB ASSEMBLY.
7. LOS ALAMOS VACINATIONS
8. JUMBO
9. PUMPKINS AND ALUMINUM PLANT.
10. TRUMANS ANNOUNCEMENT.